NOTES.

THE Board of Agriculture and Fisheries has taken a step long overdue, and now the one competent entomologist on its permanent staff can look forward to assistance in doing the work which twenty competent entomologists might, perhaps, be expected to perform. An entomological laboratory has been established and placed at Rothamsted, where a chief entomologist and two research assistants are to devote their whole time to investigation. The further proposal to appoint twelve advisory entomologists for the twelve agricultural divisions of England is one the advantages of which are doubted in a leading article in the *Times* of October 10. It would be better, our contemporary thinks, "were the research staff at Rothamsted to be increased, and arrangements made for the investigators to visit, now Cornwall, now Northumberland, wherever a local problem became urgent, returning to their headquarters to pool their experience and their results." Research is needed, very much needed, and probably nowhere else in England could greater facilities for investigations of the kind required be found than those at Rothamsted. But if the practical value of entomological research is to be brought home to the farmer, the fruit grower, or the breeder of stock, he must have his eyes opened for him and be given instruction on the spot; it can never be attained simply by the distribution of pamphlets or journals, no matter how well prepared or how valuable the advice they may give. The divisional entomologists should do something more than give advice when called upon; they might make periodical inspections, and have a look out for incipient stages in the diseases of crops in their divisions, as well as for critical stages, so that means could be taken in time to prevent the spread of the disease. It should also be their duty, rather than directly that of the farmer, to keep in touch with what was going on at headquarters, and to become acquainted with all the latest discoveries brought about by research. Even in research they themselves need not be idle, if they have been properly trained, and are qualified, as they should be, to carry it on.

THE annual exhibition of the Royal Photographic Society is again held at 35 Russell Square, as, owing to the requirements of the Government, none of the larger galleries are available. But the scientific section suffers nothing on this account, as the society in its own house has greater facilities for displaying the exhibits. This section fully maintains its reputation. There are forty-three colour transparencies on autochrome plates out of a total of forty-six, but this kind of work is now so well established and so perfect that the interest has passed to the subject rather than to the process. Photomicrography is well represented by entomological and botanical series. A photomicrograph that stands alone must have something very remarkable indeed about it to justify its exhibition. The radiographs of surgical and medical interest are as numerous and valuable as ever, and the application of Röntgen rays to the detection of hidden defects in metal castings and in aeroplane parts is strikingly and beautifully illustrated. Concerning novelties in scientific methods and apparatus, the splendid exhibit of grainless and filmless photography by the Messrs. Rheinberg richly deserves the medal awarded to it. It includes scales on glass for apparently every conceivable purpose, from micrometer scales to scales 30 cm. long. Messrs. Adam Hilger show a spectrograph on an improved Schumann plate which records lines from wave-lengths 21 to 67, and photographs that illustrate the use of the interferometer for testing camera-lenses. The exhibition closes at the end of November.

THE subject of the declining birth-rate was raised at the Church Congress on October 15 in two papers. The Bishop of Birmingham held that restriction of births was due in most cases to prudential motives and to a sense of responsibility, and noted as a curious fact that statistics showed that doctors and clergy, who used to be very prolific, now had smaller families on the average than other people. The nation wants more children, but wants them of the best quality. There must be cases where some kind of control should be exercised, and that must be before conception is known to have taken place. Dr. Amand Routh directed attention to parental syphilis and alcoholism as causes of ante-natal and neo-natal disease and death. He condemned the circulation of so-called "prophylactic packets" as likely to increase rather than to diminish venereal disease. He stated that in the six months ended March 31 last deaths in England and Wales exceeded births by 126,445—for the first time in our statistical history. Dr. Stevenson, Superintendent of Statistics, attributed this to a decline in fertility. Dr. Letitia Fairfield stated that venereal diseases had not only spread during the war, but had rapidly increased since the armistice, and urged an addition to the number of clinics. The Archbishop of Canterbury considered that the use of prophylactics would be perilous as smoothing the way towards vice, but approved the efforts of the National Committee for the Prevention of Venereal Diseases.

IT is with sincere pleasure that we learn that M. Emmanuel de Margerie has been appointed Director of the new Geological Survey of Alsace and Lorraine. M. de Margerie brings to his official duties the knowledge gained by years of cultured conference with geologists throughout the world, and we are indebted to his wide reading and his personal acquaintance with the face of the earth for the French edition of Suess's "Antlitz der Erde." This, far from being a mere translation, is the form in which the book will live as a monument to Austrian powers of collation and construction and to French lucidity of exposition. M. de Margerie's published work has been geographical as well as geological, and it is pleasant to picture him as looking out from the heights of the Vosges on river-profiles once more associated with France. Many questions of economic geology, and therefore of national welfare, will come before him in the recovered provinces. While his sympathetic spirit will find no barrier in the Rhine, his vindication of the attitude of the Entente Powers, addressed during the war to Prof. Heim of Zürich, proves him to be the right man for the task of reconstruction on the frontier.

MR. FRANCIS JEFFREY BELL, who has just retired from the Natural History Museum under the age-limit, entered the service of the trustees on August 12, 1878, when the Zoological Department was still at Bloomsbury and Prof. Owen the superintendent. He took an active part in the removal of the collections to South Kensington in 1882–83, and concerned himself with various divisions of the marine invertebrata, giving especial care to the exhibition of selected types. Mr. Bell is emeritus professor of comparative anatomy in King's College, London, and he served for many years as one of the secretaries of the Royal Microscopical Society, the Journal of which he also edited. In 1898 he acted as general secretary of the International Congress of Zoology, and for many years was a constant attendant at the council of the Marine Biological Association. Mr. Bell is part editor of the Museum report on the collections of the

Southern Cross, and he has seen all six volumes of the *Discovery* Antarctic report through the press.

We learn from *Science* that Mr. John D. Rockefeller has given to the General Education Board, founded by him in 1902, twenty million dollars, the income of which is to be currently used and the entire principal to be distributed within fifty years for the improvement of medical education in the United States. The working capital previous to this accretion amounted to between 35,000,000 and 40,000,000 dollars. Since the present sum is to be devoted exclusively to medical education, whereas the board's previous resources, under the terms of the charter granted to it by Congress, have been devoted to "promoting education within the United States, without distinction of race, creed, or sex," the activities of the organisation with respect to medical teaching will be greatly increased.

According to the *Morning Post,* the Norwegian traveller, Dr. O. Olsen, proposes to conduct a small anthropological and botanical expedition to Siberia next spring. Dr. Olsen has had previous experience in Siberia when in 1914 he studied the Soyot tribes in southern Transbaikalia, near the Kitoisk Mountains. His present project is to go to the Yenisei valley north of Krasnoyarsk, and to push thence into the less known regions immediately to the east, with the object of studying several little-known tribes. These include the Dolgans, a Yakut tribe living between the Yenisei and the Khatanga; certain races of Samoyedes; and certain tribes of Tungus. The expedition also proposes to bring back with it, about January, 1921, seeds of Siberian conifers suitable for planting in Norway.

We have received a copy of the "Annuaire de l'observatoire royal de Belgique" for 1920, edited by M. G. Lecointe. We are glad to note that the publication of this useful little annual was continued throughout the years of the German occupation of Belgium. The observatory at Uccle was held by the Germans, but its scientific work continued. There was no interruption in its publications, and even research did not completely cease. Needless to say, the Belgian staff was responsible for this continuous activity, M. Stroobant replacing for the time M. Lecointe, who was with the Belgian Army.

The assistant secretary of the British Association, Mr. O. J. R. Howarth, has been charged with the collection of materials for a history of the association. The records available in the office, especially those referring to the foundation of the association, are far from exhaustive, and the loan of any letters or other documents bearing upon the history of the association will be gratefully welcomed by Mr. Howarth at the office of the association, Burlington House, W.1, and they will be duly returned after use.

The Secretary of the Department of Scientific and Industrial Research informs us that the following research associations have been formed in accordance with the Government scheme for the encouragement of industrial research:—British Rubber and Tyre Manufacturers' Research Association (c/o Messrs. W. B. Peat and Co., 11 Ironmonger Lane, E.C.2) and the Linen Industry Research Association (secretary, Miss M. K. E. Allen, 3 Bedford Street, Belfast).

The council of the Chemical Society has arranged for the delivery of three lectures during the coming session dealing with the work accomplished by chemists during the war. The first of these will be delivered at Burlington House on December 18 at 8 p.m. by Prof. James Walker, who will lecture on "War Experiences in the Manufacture of Nitric Acid and the Recovery of Nitrous Fumes."

The council of the Ray Society has appointed Dr. W. T. Calman, of the Zoological Department, British Museum (Natural History), to be secretary in succession to the late Mr. John Hopkinson.

The annual report for 1918 on the Forest Administration of Nigeria shows the number of forest reserves to be gradually increasing. Their total area now amounts approximately to 1462 square miles in the Southern Provinces and to 3965 square miles in the Northern Provinces. Plantations continue to be made, in spite of the greatly depleted European staff and the disorganisation caused by the influenza epidemic. Apart from mahogany and *Albizzia lebbek,* the species that have proved most successful are *Cassia siamea, Dalbergia sissoo, Grevillia robusta,* and *Melaleuca leucodendron,* all of them exotics. In fact, it is very probable that, as experienced in South Africa, the planting difficulty in the Northern Provinces will be solved only by the introduction of suitable exotics. Hence these operations must, for some years to come, be of an experimental nature.

A number of papers dealing with marine biological and fishery subjects have recently been published. The Danish series, "Meddelelser fra Kommissionen for Havundersogelser," contains articles on purely fishery, hydrographic, and biological investigations. A very useful account of the North Atlantic halibut fishery, including work on the biology of the species, as well as on its exploitation by fishing vessels, is given by P. Jespersen in Bd. v. (No. 5) of the Fishery Series, and a very interesting paper by A. C. Johansen in the same series deals with the biometrics of the spring-spawning herrings that form the bulk of the fish caught during the great spring and summer fisheries. There is also an account of fish-marking experiments carried out on the Faröese fishing grounds. This is local in its scope, but it is interesting to see, from the results, to what an extent this region must have been exploited by British trawlers in the years immediately preceding the war.

In Report No. 4 of the Industrial Fatigue Research Board Mr. Major Greenwood discusses "The Incidence of Industrial Accidents upon Individuals, with Special Reference to Multiple Accidents." As a result of an elaborate mathematical analysis of a large mass of statistical data, Mr. Greenwood comes to the conclusion that the distribution of accidents among the employees at a factory is by no means a matter of chance, but that certain individuals are much more liable to accidents than others. This susceptibility to accidents is not due to the workers being quicker at their job than their fellows, nor do they differ from them appreciably in general health. It seems to be a matter of personality, and not determined by any obvious extrinsic factor. As Mr. Greenwood points out, the weeding-out of these specially susceptible individuals would lower the average accident-rate of a factory considerably, and it might, in certain instances, have a more important effect than this. In some industries, such as certain of the explosive-supply trades, an accident may lead to frightful disaster, and it might be well worth while to track down these unsafe people by a study of the ambulance-room records and get them transferred to a less risky industry.

The limitation of human settlement in South Africa through deficient water-supply has moved Prof. E. H. L. Schwarz to undertake a journey to Ovamboland, a little-known district north-west of the Kalahari region, which seems threatened by the desiccation that has overtaken the country to the south. In a paper entitled "The Kalahari Lake Scheme" (*S. African Mining and Engineering Journal*—the complete reference is not given on the separate copy sent us), Prof. Schwarz proposes to save Ovamboland and its native population by damming the Cunene River at the cataracts and diverting the water that now flows into the Atlantic back into a depression known as the Etosha Pan. Hence irrigation could be arranged northwards and eastwards. A "Makarikari Lake" is also proposed as a development of the Soa Pan, west of Bulawayo, and from this irrigation might be possible in the eastern Kalahari down the channels of streams flowing to the Orange River. The scheme is already exciting discussion in the States of the Union.

IN a recently published memoir of the Carnegie Institution of Washington (No. 285), Prof. T. H. Morgan gives an account of his experiments relating to the secondary sexual characters of poultry, and discusses at some length the genetic and operative evidence with regard to secondary sexual characters in general. In some breeds of poultry, notably Sebright bantams, the cocks are feathered like the hens, lacking the long, silky hackles of the neck and saddle, and the curved sickle feathers in the tail that distinguish the cocks of normal breeds. Prof. Morgan demonstrates by crossing experiments with game bantams—a breed with the normal sexual differences of feathering in the cock—that the hen-feathered condition is dominant. His figures suggest that two factors are concerned, but the experiments are not sufficiently extensive to render this certain. Castration experiments were performed on the Sebright cocks and some of their hen-feathered progeny, and the interesting fact was disclosed that removal of the testes results in the male assuming a type of plumage characteristic of the cocks of normal breeds. The fact is of great interest in connection with the recent work of Goodale, who showed that removal of the ovary from the hen leads to the assumption of the male plumage. A further point of interest lay in the demonstration of luteal cells in the testes of hen-feathered cocks, similar to those which are known to occur in the ovary of normal hens. Cells of this type are stated to be absent from the testes of normal cocks. The greater part of the memoir is taken up with a discussion of secondary sexual characters in animals generally, in relation both to Darwin's hypothesis of sexual selection, and to the many other views which have been put forward at various times since. A brief review is also given of the heredity of the colour of the plumage in domestic fowls. The memoir contains an ample and useful bibliography, and is well illustrated with coloured and other plates.

THE economic value of the forests of New Zealand is discussed by Mr. D. E. Hutchins in the Transactions of the Royal Scottish Arboricultural Society (vol. xxxiii., part 2, July, 1919). The forests are of great value, and admittedly the best soft-wood forests in the southern hemisphere. In quality New Zealand timbers come before those of Europe and Australia and after those of North America. The valuable kauri-pine (*Agathis australis*) is the largest timber-producing tree in the world, owing to its massive bole having little or no taper. At one time there were about three million acres of kauri forest in New Zealand, now reduced to about half a million, in the extreme north. The next most valuable timber is supplied by another conifer, Totara (*Podocarpus totara*); it is very durable and of a fine colour. This tree is generally distributed through the North and South Islands. A third conifer, Rimu (*Dacrydium cupressinum*), also abundant throughout the islands, is the common house-building timber, a deep red, strong, hard, and heavy wood. White pine (*Podocarpus dacrydioides*), one of the tallest trees in the colony (the writer records one of 210 ft.), has white, easily worked timber suitable for inside work. Honeysuckle (*Knightia excelsa*), a tall, handsome tree with beautifully variegated wood, has never been exported. There is a large class of so-called secondary timbers in New Zealand forests which have never been utilised. The writer deplores the destruction of forests without any attempt to discriminate between land best suited for farming and land best suited for forestry. In 1886 the forest area of New Zealand was estimated at 21,000,000 acres, which by 1909 had become reduced to about 17,000,000 acres. The forests even in their present reduced and neglected condition are worth more than all the known mineral wealth of New Zealand, and they still offer more employment than any other industry. Compared with sheep-farming, the New Zealand forest, if worked as are forests in Europe, would afford about ten times the employment.

IN the *Indian Forester* for July last, Mr. H. H. Haines gives an elaborate description, with figures, of the various shrubs belonging to the genus Carissa, the bark and leaves of which are an important source of tannin. Thirteen species have been described by various authors, but these are reduced by Mr. Haines to five distinct species with several varieties.

MR. ALEX. L. HOWARD wrote some time ago in the *Timber Trades Journal* a series of short articles giving a popular description of the most important woods that are imported into London from India, with notes upon their properties and uses in this country. These articles are now issued by Messrs. W. Rider and Son in pamphlet form, entitled "The Timbers of India" (pp. 16, quarto, price 2*s*. 6*d*.).

IN the description which appeared in NATURE of October 9 of the aurora of October 1, and the simultaneous magnetic storm, several observations were recorded, but unfortunately the time reckoning is not the same throughout. The observations described in the first and last paragraphs were received from the Meteorological Office, and the times mentioned in them were all referred to the civil day, which runs from midnight to midnight, whereas in the other paragraphs describing observations at Bristol and in the Isle of Man the astronomical "day" seems to have been used. When the change of time reckoning to which astronomers have agreed comes into force, the risk of similar accidents will be obviated.

SIR ROBERT HADFIELD has just issued copies of a Foreword which he prepared on the occasion of the Prime Minister's recent visit to Messrs. Hadfield's works at Sheffield. Sir Robert has some timely remarks on the labour situation in the country and the extreme necessity for joint intelligent effort on the part of capital and labour, without which understanding the burden of debt arising from the war cannot be wiped out. During the present year many hundreds of valuable working hours have been lost as the result of trade disputes; but it is really hard to see what can be done without increased enlightenment of the working classes, whose destinies may be said largely to rest with themselves. Sir Robert pleads for the revision of the existing patent laws in this country, so that all classes, without distinction, may benefit from the fruit of their discoveries.

Some space is devoted to the importance of inventions and research in connection with war munitions, and it is interesting to note that Sir Robert's firm is now in a position to manufacture a heavy calibre naval shell which, for range and piercing power, will far outstrip anything previously accomplished. Invention should be stimulated and every effort made to discover fresh inventors, and, once they are discovered, to encourage them to give their ideas to the world so that everyone may benefit from them.

CONSIDERABLE interest is attached to the description in *Engineering* for October 10 of the geared turbines supplied by the De Laval Steam Turbine Co. to the Swedish destroyers *Wrangel* and *Wachtmeister.* The high- and low-pressure turbines occupy separate casings, and drive pinions engaging on opposite sides of the main gear wheel. The high-pressure turbine casing accommodates a cruising element, and the low-pressure turbine an astern turbine. The wheels of both high- and low-pressure turbines are designed to make 3600 revs. per min. at full power, and the maximum peripheral speed is 180 metres per second. The cruising element consists of one velocity-compounded wheel, followed by a simple impulse wheel. The main turbine has four wheels. The astern turbine has one velocity-compounded wheel with two rows of blading, followed by a simple impulse wheel. The aggregate shaft horse-power at full power is 11,000, with the propellers running at 450; the astern shaft horse-power is 4400, with propellers running at 250. With steam 97 per cent. dry, the turbines were guaranteed to consume not more than 5·2 kg. of steam per shaft horse-power hour at full load. Double helical gear wheels are used for speed reduction, and the pinions are rigidly mounted. The pitch line speed at full power is 35 metres per second. Michel thrust-blocks have been fitted, and their remarkable qualities confirmed by the tests.

OUR ASTRONOMICAL COLUMN.

NOVÆ.—Yet another nova has been found on the Harvard plates, this time by Miss Woods (Harvard Bulletin 693). Position for 1875: R.A. 18h. 24m. 6·2s., S. declination 29° 28·9′. Its former magnitude was 14, but it rose temporarily to 11 in 1901. On April 24, 1919, it rose to 7, and has now sunk again to 12, its image appearing nebulous. The magnitudes are photographic.

Pubs. Ast. Soc. Pac., August, 1919, contains a paper by Dr. Shapley on a nova of another kind that was discovered by Prof. Wolf two years ago, and independently by Prof. Barnard in the present year. Its place for 1917·0 is R.A. 17h. 35m. 13·45s., S. declination 11° 53′ 57·6″; its photographic magnitude is 11 (Harvard scale); spectral type, FO; radial velocity large and positive. All plates exposed before 1909 fail to show it; all since 1910 show it. Three interpretations are suggested:—(1) That it is really just beginning its stellar career, in which case it is of unique interest; (2) that it is a long-period or irregular variable, somewhat like η Argûs; and (3) that it has just emerged from behind an obscuring nebula. To test this last suggestion, Dr. Shapley took a long exposure with the 60-in. reflector and studied the distribution of faint stars. The results, given in the paper, while not inconsistent with the hypothesis, give no decisive evidence in its favour; there is no distinct line of demarcation of stellar density, as in some of Prof. Barnard's dark nebular regions. However, a much smaller cloud than these would suffice in this case.

Mr. Joy has made an estimate of the star's distance by the Adams spectroscopic method, finding 500 parsecs. A Harvard plate of 1909 July 9 shows it of magnitude 14·4; 1910 March 21, 11·3. Since 1915 it has been 11.

Both Mr. C. P. Olivier (*Ast. Journ.*, No. 757) and Messrs. Van Maanen and Sanford (Pubs. Ast. Soc. Pac., August, 1919) publish preliminary values of the parallax of Nova Aquilæ 1918. Their values (absolute parallax) are 0·060″ and 0·009″. The latter, which implies a distance of 362 light-years, is close to the values found for Nova Persei, both by direct measures and by the expanding nebular illumination. All the observers contemplate further measures when the brightness of the nova has sunk nearly to that of the comparison stars.

THE SUN-SPOT CURVE.—Mr. Seth B. Nicholson gives an interesting curve of sun-spot activity in Pubs. Ast. Soc. Pac., August, 1919. It is constructed simply from the number of spots, regardless of area. Mr. Nicholson places the late maximum in September, 1917, and the curve since then shows a notable decline. The previous maximum is placed in May, 1905, and is both flatter and lower than the recent one. The minimum is shown in June, 1913. There are also curves of the mean latitude of spots, which show that the fall in latitude since the last minimum has been much steeper than in the preceding cycle.

Mr. Nicholson directs attention once more to the resemblance of the spot-activity curve with the light-curve of Cepheid variables. The sun's surface is certainly not pulsating, as those of the Cepheids are believed to be; if the resemblance of curve means anything, it suggests that there may still be remnants of pulsation in the sun's interior.

SOLAR RADIATION.—Mr. C. G. Abbot (Proc. Nat. Acad. Sci., U.S.A., September, 1919) gives an account of the simultaneous measures of solar radiation made in 1918 at Mount Wilson and Calama, Chile. The results give still stronger support to the hypothesis that the short-period variations in the radiation are in the sun itself than did those at Mount Wilson and Algeria in 1911–12. Mr. Abbot states that the Calama results are telegraphed to Argentina, and successful predictions of temperature are based upon them. He suggests additional radiation stations at various cloudless regions, which he anticipates would be of great utility in weather prediction.

NEW SOURCES OF ALUMINIUM IN NORWAY.

DURING the war neutral as well as belligerent countries had to search within their own borders for those raw materials which formerly they were content to import; new occurrences of well-known ores have been discovered, and new methods devised for winning important products from rocks which hitherto have possessed no commercial value. Norway was particularly hard hit by the curtailment of international trade, and, amongst other problems, that of finding a home source of aluminium presented itself, and seems to have received a promising solution.

The metal aluminium can be obtained by electrolytic means from its oxide, and nearly all the suggested methods of manufacture depend upon this as a final stage, the main difficulty being the preparation of a sufficiently pure oxide, free from iron and silica. The ore commonly used is bauxite, after a rather costly preliminary purification by the Baeyer process. At the outbreak of war the Central Powers